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## *Aldo Clementi musicus mathematicus*

**ABSTRACT:** Like that of Liszt and Stravinsky, the composers by whom he was attracted in his adolescence and early youth, Aldo Clementi's (Catania 1925-Rome 2011) musical production went through various phases, greatly changing on the surface and in appearance, though not in depth and substance. He himself suggests a division into five phases:

1. *Preliminary* (1944-1955), juvenile and apprenticeship works.
2. *Structural* (1956-1961).
3. *Informal material* (1961-1964).
4. *Non-formal optical* (1966-1970).

5. *Polydiatonic* (1970-2011): groups of letters indicating musical notes (for example: B-A-C-H), or *canti dati* (modal or tonal – monodic or polyphonic – compositions of the western tradition, from the *Stele of Sicily* to Stravinsky), but most often segments of melodic lines inferred from them. But – in the polyphonic counterpoint that derives from it – they are simultaneously intoned in the different voices in different tonalities: hence their superimposition restores the chromatic dodecaphonic total. Clementi himself proclaims the constitutional continuity of this development. The substance of his music consists in the direct transposition of a figurative project into a sonorous structure. *Geometrie di musica*: the title of the 2001 book by Gianluigi Mattiotti refers first of all, as the subtitle says, to *The <poly>diatonic period of Aldo Clementi*, but it perfectly defines his whole musical production, all pervaded by dense polyphonic counterpoints.

For Clementi construction is a goal, not a means to articulate discourse: indeed, he was even to do without discourse in his three central creative periods; and when in the fifth and latest one he has returned to it, he has enslaved it entirely to construction: he draws fragments from it, to be used as raw material, i.e. the diatonic subjects, of his dodecaphonic counterpoints. After the different phenomenology of the eruptions of sound matter of Varèse and Stravinsky, Clementi's music represents a further peak of pure construction in the sonorous space. His counterpoint however, like Webern's, is limpid, subtly articulated, and dominated by reason: but here construction reigns supreme, and the composer in accordance with his requirements uses discursive melodic segments as raw material, as bricks ("modules" he says, and he describes them as mosaic tiles). "The idea of a construction achieved with the dovetailing of mirror-like images is also at the base of the figurative research of Escher, hinging on the concept of division of the plane, through repeated figures, mirror-like and congruent" (Mattiotti). Indeed, Clementi's music is "*disciplina quae de numeris loquitur*" (discipline that speaks of numbers), according to the definition by Cassiodorus, rather than "*scientia bene modulandi*" (art of singing well), according to the definition by Augustine; and it is, more precisely, paraphrasing the famous definition by Leibniz, "*exercitium arithmeticae manifestum coscientis se numerare animi*" (*evident arithmetical exercise of the mind aware of counting*).

Three compositions of Clementi's polydiatonic period are here thoroughly considered: two canons for string quartet, the very simple four-voiced *Canone on a fragment by Platti* (1997) and the very complex eight-voiced *Tributo* (1988) on "Happy birthday to you!"; and a de-collage, *Blues* and *Blues 2*, "fantasies on fragments by Thelonious Monk", for piano (2001).

**KEYWORDS:** Aldo Clementi, Polydiatonic, Constitutional categories, Discourse construction, Modules, Canon, De-collage, Cassiodorus, Augustin, Leibniz.

Like that of Liszt and Stravinsky, the composers by whom he was attracted in his adolescence and early youth, the musical production of Aldo Clementi (b. 1925, Catania – d. 2011, Roma) went through various phases, greatly changing on the surface and in appearance, though not in depth and substance. He himself (Clementi 1970, 77; and 1973, 49–50; Mattiotti 2001, 10–11) suggests a division into five phases:

1. *Preliminary* period (1944–1955), juvenile and apprenticeship works: from the *Preludio* for piano to the *Tre piccoli pezzi* for flute, oboe and clarinet.

2. *Structural* period (1956–1961), from the *Tre studi*, for chamber orchestra, to *Triplum*, for flute, oboe and clarinet: it begins with the move to Milan to study with Bruno Maderna and it coincides with his attending the *Ferienkurse* in Darmstadt. “Short or long *structures of measured* accelerations or decelerations” determine “zones with different densities or tensions” (Clementi 1973, 49).

3. *Informal material* period (1961–1964), from *Informel 1*, for percussion and keyboard, to *Variante C*, for orchestra.

The need to not hear the single interval or any other *detail*, and the need to annul any type of articulation led to a sort of static matter: this was through dense counterpoint around a cluster, which acted as a total-chromatic continuo, annulling perception of the single internal movements, which in turn ensured constant vibratility (Ibid., 49–50).

Under the influence of the ideas of John Cage and the painting of Achille Perilli, he replaces the rigid structures of the preceding phase with informal biomorphic structures. He himself represents them with an undulating skein of dodecaphonic threads.

4. *Non-formal optical* period (1966–1970), from *Reticolo 11*, for eleven instruments, to *Reticolo 12*, for twelve string instruments: under the influence of the painting of Piero Dorazio and Victor Vasarely and of Optical-Art, the “counterpoint becomes [...] more optical-illusory than material” (Ibid.) and – deprived of dynamic indications – tends to a continuum: the dodecaphonic threads of the skein are now straight.

5. So-called *diatonic* period, which it would be better to call *polydiatonic* (from 1970 onwards), from *BACH*, for piano, to the last works; the subjects are *res factae*: lemmas of alphabetical letters indicating musical notes (for example: B-A-C-H), or *canti dati*, i.e. segments of melodic lines from modal and tonal masterpieces in the western tradition, from the stele of Sicily to Stravinsky. But – in the polyphonic counterpoint that derives from it – they are simultaneously intoned in the different voices in different tonalities: hence their superimposition restores the chromatic dodecaphonic total.

Clementi himself proclaims the constitutional continuity of this development. The representation of his various phases in abstract visual figures is not an explanatory expedient, but it highlights the substance of his music: this consists in the direct transposition of a figurative project into a sonorous structure. *Geometrie*

*di musica*: the title of the book by Gianluigi Mattiotti refers first of all, as the subtitle says, to *The diatonic period of Aldo Clementi*, but it perfectly defines his whole musical production, all pervaded by dense polyphonic counterpoints. The constitution of the music of the true Composer remains and cannot change; in his own way he pours out to us the Sound that in his own way he hears inside him: it can and indeed must often change its clothes, mood and even appearance, but it cannot change its body, and all the less its soul.

“The spatial constitution of the new music,” I wrote in 1965 (Carapezza 1965, 88) “looks like a predestined point of arrival.”

I myself wrote in 1961 *La costituzione della nuova musica*, defining the new music as a construction in sonorous space [...] to the point of making it coincide [...] with a construction in visual space, that is to say with its same notation, which would become its material and visible incarnation [...]: painting as raw music, music as sonorous realization of a construction in visual space (Carapezza 1999: 61-62).

But at that time I was thinking above all of the graphisms of *Folio* and *Four Systems* by Earl Brown, of *Piano pieces for David Tudor* by Sylvano Bussotti, of *Atlas Eclipticalis* by John Cage and of the aquarelles of my own *Cieli*: and I then had to recognize (Ibid.) that this tendency had proved unfruitful. By contrast, it is fecund in the works, free of all graphic mannerism, of Clementi, who aims, through the aid of graphic means, directly at the sonorous substance.

The history of the music of our civilisation, from Homer to the present day, evolves in the dialectical tension of two constitutional principles: that of *discourse*, which immediately appears hegemonic in antiquity and in the early Middle Ages, and that of *construction*, which timidly appears in the two-voices chants of the *Musica enchiridialis* of the 9<sup>th</sup> century. In music, construction became independent of discourse in its first amazing culmination around the year 1200, with the polyphony of the four-voice *organa* of Perotinus Magnus at Notre Dame Cathedral in Paris. In the 14<sup>th</sup> century with *Ars nova* there began the synthesis of the two constitutional principles; in this synthesis, nevertheless, construction was to attain hegemony and a higher and more complex second culmination in the 15<sup>th</sup> century with the polyphonic masses of Ockeghem: among them the *Missa Prolationum* is “perhaps the greatest contrapuntal enterprise of the 15<sup>th</sup> century” (Perkins 1980, 493), and therefore – I believe – absolutely the greatest, among mere musico-mathematic constructions, down to those of Aldo Clementi. After Ockeghem, Josquin and Willaert further developed construction, but they put it at the service of discourse; and to the latter it was entirely enslaved with this *seconda pratica* of Rore and Monteverdi; whence the harmonic discourse of modern music.

Inside this harmonic discourse, Bach recovered all the constructive artifices of Renaissance polyphony: canonical counterpoint, which produces fugues, with possible inversion and regression, diminution and augmentation of the subject. But the principle of discourse to a great extent continued to be dominant, despite the rococo

rhythmic crystallization of the 18<sup>th</sup> century, which was to culminate in the early 19<sup>th</sup> century in Rossini. Construction was to return quite suddenly in the 20<sup>th</sup> century with the magmatic eruptions of Varèse and Stravinsky. In Webern, limpid and dominated by reason, it is subtly articulated and is evident to the greatest possible degree, but as in Josquin it is put nevertheless at the service of discourse: “a novel in a sigh.”

Clementi, who first started from Stravinsky, then started again from Webern. But for Clementi construction is a goal, not a means to articulate discourse more effectively: indeed, he doesn’t use discourse in his three central creative periods; and when in the fifth and latest one he returns to it, he enslaves it entirely to construction: he draws fragments from it, to be used as raw material, i.e. the diatonic subjects, of his dodecaphonic counterpoints. After the entirely different phenomenology of the eruptions of matter of Varèse and Stravinsky, Clementi’s music represents a further peak of pure construction in the sonorous space.

Clementi’s counterpoint, like Webern’s, is limpid, subtly articulated, and dominated by reason: but here construction reigns supreme, and the Composer in accordance with his requirements uses discursive melodic segments as raw material, as bricks (“modules” he says, and he describes them as mosaic tiles). He sums up the composition procedures of his polydiatonic period in a letter of the 8<sup>th</sup> October 1979 to Nino Titone, the founder of the *Settimane Internazionali Nuova Musica* in Palermo:

In 1971 I began to work with diatonic modules [...] My technique is always contrapuntal and canonical: the diatonic module as a tile for a mosaic: that is *diminution* with respect to the twelve notes, but more opportunities to build with the four mirror-like forms of modules themselves, in some works also decreased and increased (Clementi 1973, 133).

And Mattietti comments (2001, 66):

The idea of a construction achieved with the dovetailing of mirror-like images is also at the base of the figurative research of Escher, hinging on the concept of division of the plane, through repeated figures, mirror-like and congruent.

That is to say the four canonical forms: Original (O), Inverse (I), Retrograde (R), and Retrograde of the Inverse (RI) (Figure 1). Many of the compositions in Clementi’s late style come into being

on the stimulus of images by Maurits Cornelis Escher. Clementi harks back to the experiences of *Optical Art*, inventing a deceptive grid of sounds (Ibid., 28). [...] Reiteration, precisely of the dovetailing of equal elements, corresponds to an attempt to capture the infinite, fixing it in a finite structure, and it suggests an image of continuous rotation, analogous to that of the canon. Escher’s poetic therefore appears entirely to mirror that of Clementi: with the repetition of figures, Escher seeks to set time moving in a dimension which is in itself static, like that of the picture; Clementi, instead, with chromatic saturation seeks to make us perceive as space a substance which is in itself temporal, like music. In both cases the reiteration of figures (themes or images) produces a spatio-temporal dimension that has the effect of a *static motion* (or *mobile stasis*). (66)



Figure 1. Maurits Cornelis Escher, *Overgangs System* (1938)

Among the many compositions of Clementi's fifth period, which I have defined "polydiatonic", one of the simplest is *Canon*, for string quartet, "on a fragment by Platti", composed in 1997 (Figure 2). The subject appears, from top down, in imitation: Original (in C minor), Regressive (in F minor), Inverse (in E flat minor) and Regressive Inverse (in D minor); the first violin is syncopated with respect to the three other instruments. After six beats, there is a three-quarter break progressively in each of the four voices, and then everything is repeated, because the composition is divided into two equal halves. It is as if there were a lot of mirrors: vertical (regressive) between first and second violin and between viola and cello; horizontal (inverse) between second violin and viola; transversal (but neither regressive nor inverse) at the beginning, at the *ripresa* and at the end of the four voices; and vertical (but not regressive) through the double bars of the two refrain signs. So the whole composition is performed, uninterruptedly, through the refrain signs, three times: "more and more quietly, more and more slowly, less and less vibrato."

Aldo Clementi  
**CANONE**  
per quartetto d'archi  
(su un frammento di Platti)  
(1997)

a Giuseppe Scotese

Ripetere il ritorno ille tre volte.  
Sempre più piano, sempre più lento.  
Sempre meno vibrato.

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Figure 2. Aldo Clementi, *Canone* (1997)

Everything flows just the same even in the most absolute immobility. Around us reality already moves too fast to seek to imitate it. The *end* naturally germinates from saturation and tiredness, but is never definitive: through desolate habituation we at once precipitate into the infinite and the eternal (Clementi 1973, 51).

Among the most complex compositions is *Tributo*, also for string quartet (Figure 3). It was written in 1988 for the eightieth birthday of the American composer Elliot Carter: the subject is precisely “Happy birthday to you!”, which appears immediately in the grave register of the viola, and, beginning from the seventh note, is “manipulated and compressed [...] inside a mirror-like hexachord STTTS” (Mattiotti 2001, 87): with two semitones at the extremities and three tones at the centre.

The composition, in *alla breve* tempo, consists in an eight-voice canonical counterpoint (two voices for each of the four instruments), “built with contiguous transpositions, such as to saturate the whole polyphonic space and with a double superimposition of the four mirror-like forms and of four different tonalities” (Ibid.) (Figure 4 a-b). The subject is single and fourfold: O = Original; I = Inverse, a semitone below; R = Regressive, a tone above; RI = Regressive Inverse, a tone below.

T R I B U T E

per quartetto d'archi

dux/comes:  $t+s$



ALDO CLEMENTI


Figure 3. Aldo Clementi, *Tribute* (1988)

Each instrument is the *dux* (leader) of one of these four, and the *comes* (companion, follower) of another one: to the *dux* of O in the viola there corresponds the *comes* in the second violin, and vice versa to the *dux* of RI in the second violin there corresponds the *comes* in the viola; to the *dux* of I in the first violin there corresponds the *comes* in the cello, and vice versa to the *dux* of R in the cello there corresponds the *comes* in the first violin. So, in this respect, the first violin has a one-to-one correspondence with the cello and the second violin with the viola: and the acute voices correspond to one another in each couple, just as the grave voices correspond to one another. Each *comes* is a tone and a half above or below its *dux*. Hence each of the eight voices begins on a different note; this gives a series of eight notes, distributed in four couples: F<sup>#</sup>-G<sup>#</sup>, F-E flat, B-A, C-D.



b)	Violin I	1	Ab	Inverse, dux
		2	D	Retrograd, comes
	Violin II	1	Ab	Retrograde Inverse, dux
		2	D	Original, comes
	Viola	1	F	Retrograde Inverse, comes
		2	B	Original, dux
	Cello	1	F	Inverse, comes
		2	B	Retrograde, dux

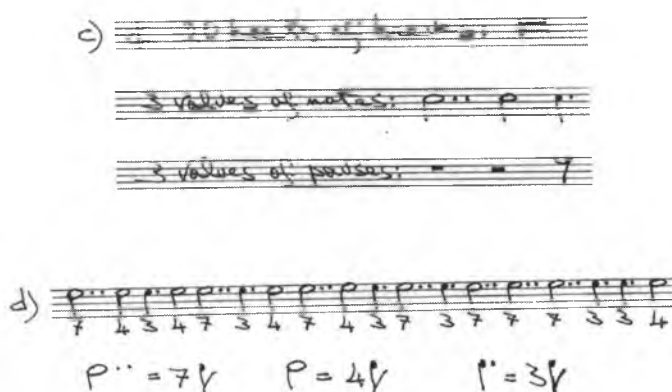
Figure 4 (a-b). Analysis of *Tribute*

These correspondences turn out to be permuted, if, instead of looking at the relationships between *dux* and *comes*, we look at those between the recto and the verso of both the Original and the Regression (O-I, R-RI): in this respect the first violin and the viola correspond to one another, on one hand, and the second violin and the cello on the other; but now in each couple the acute voice of an instrument answers the grave one of the other.

The third of the three possible combinations, the two violins on one side, against the viola and the cello on the other, derives from the tonal relationships: in the former couple the acute voice is in A flat and the grave one in D, while in the latter couple the acute one is in F and the grave one in B, at a tritone interval.

The composition consists of twenty measures of breves (Figure 4 c-d): in them only three values of notes are used (of 3, 4 and 7 quavers) and three of pauses (of 1, 4 and 8 quavers). In each of the four forms of the single subject, and in each of the four *comites* with respect to the relevant *dux*, the values of the notes and the intervals between are unchanged, according to the following series of quaver values: 7 4 3, 4 7 3, 4 7 4, 3 7 3, 7 7 7, 3 3 4; but pauses are now added and now subtracted, “to make the polyphonic structure more fluid” (Ibid.): what an amazing strategic refinement! Thus the chess champion respects the preset rules (i.e. the canon), and plans the game and the movements, but decides on the spur of the moment when and how to make them.



Figure 4 (c-d). Analysis of *Tribute*

Between the eighth and the eleventh measure all the eight voices complete their subjects; and between the tenth and the thirteenth they start to repeat them, but permuting the order of the entrances, so that they completely change the intertwining of the voices and the harmony that results from them, while some *duces* exchange role with the relevant *comites*: now the four *duces* are all in the violins and the four *comites* in the low instruments! Thus each voice repeats its subject, maintaining the order, pitch and duration of the notes; but again (as previously in the generation of *comites* from *duces* and *inverses* from *originals*) pauses – of one, two or three minims – are now added and now subtracted. Between the seventeenth and twentieth beats all the voices again complete their subjects; but in this ending, at the middle of the nineteenth measure, a new beginning re-emerges, because – as indicated by the *ritornello* signs at the end of the twentieth measure – everything is started again *da capo*.

In the preface to the score, the composer warns that “the duration values are often astraddle the bars”, which however are not on the staves, but between them, to connect the two voices of each instrument and thus facilitate reading. Hence the score resembles the coeval critical editions of Renaissance polyphony, with *Mensurstriche* (segments between the staves) instead of bars through the staves; indeed in the 16<sup>th</sup> century only detached parts were printed, without any bars. Obviously of this work by Clementi too there are detached parts: four, that is to say one for each instrument; here the two voices, however, are on a single staff, regularly crossed by bars, and the tonal conflict between them is resolved by eliminating accidentals at the beginning of the staves and placing them, instead, before the single notes.

“The piece is performed three times, more and more slowly” – prescribes the author – in a continuous diminuendo of *speed* (from minim = 80 to minim = 40), *intensity* (mp, p, pp), and *vibrato* (normal, little, none). And in each instrument the bow now produces the sound normally, now on the fingerboard, and now on the bridge, in a continual exchange which is both horizontal and vertical:

<i>instrument</i>	<i>first time</i>	<i>second time</i>	<i>third time</i>
<b>Violin I</b>	Normal	Fingerboard	Bridge
<b>Violin II</b>	Fingerboard	Normal	Fingerboard
<b>Viola</b>	Bridge	Fingerboard	Normal
<b>Cello</b>	Fingerboard	Bridge	Fingerboard

The predominance of long notes, together with the three repetitions, the *rallentando*, the *diminuendo*, and a performance devoid of inflexions, confers on the whole the effect of a harmonic band, dotted only with accented notes (Mattietti 2001, 87).

In the year 2001 Clementi composed *Blues* and *Blues 2* (Figure 5), “Fantasies on fragments by Thelonious Monk”, for piano. In these works too there is a single figure that, rotating in the sonorous space, is introduced in the four forms (O, R, I, RI); however, it is not a simple linear figure subjected to canonical counterpoint, but a chordal and linear figure, fragmentary and composite. It is obtained with the technique of *décollage*, typical of the painter Mimmo Rotella (1918–2006), seven years older than Clementi; it is as if on the music of Thelonious Monk a black blanket of silence was lowered, which here and there is lacerated by Clementi. 12 fragments, thus uncovered, appear (O), 3 of one measure, 5 of 2, 3 of 3 and 1 of 4: “between one fragment and the other 4–5 seconds of silence.” After the twelfth measure, as in a vertical mirror everything goes back (R). *Blues 2* is then obtained by setting a horizontal mirror under *Blues 1*: this gives, inverted and transposed, the other two canonical forms (I and RI). But here too, given the chessboard, the figures and the rules, the Composer makes his moves, which determine subtle changes: tonal, melic, harmonic and rhythmic.

The constitution of Clementi’s music is analogous to that of Renaissance polyphony. This need not surprise us, if we consider that Webern is his main reference point, and that Maderna was his teacher. When Anton Webern started to have composition lessons from Schönberg in the autumn of 1904, he had already been studying musicology for two years with Guido Adler at the University of Vienna: and in 1906 he took his PhD with a critical edition of the second part of the *Choralis Constantinus*, a masterpiece composed in 1509 by Heinrich Isaac. Bruno Maderna in turn had been an alumnus of Gianfrancesco Malipiero, who nurtured him on Renaissance polyphony and educated him with *Le istituzioni harmoniche* (1558) of Gioseffo Zarlino: and Maderna did the same with his students, the most illustrious of whom are Luigi Nono and Aldo Clementi; and the most obscure one myself, who can now testify to it through direct experience. And I did the same with the composers who were my pupils: Salvatore Sciarrino, Federico Incardona, Giovanni Damiani and Emanuele Casale are renowned among them.

The substance of the music of Ockeghem and Isaac, of Webern and of Clementi, is not chordal concatenation, to which we are accustomed: harmony is not to be conceived as a succession of chords in mutual phonematic opposition,

The image shows a handwritten musical score for piano, consisting of five systems of staves. The notation includes various musical symbols such as notes, rests, and accidentals. Above the staves, there are handwritten annotations in a sequence: 11, 12, 12, 11, 10, 10, 11, 12, 11, 12, 11. These numbers are enclosed in boxes. Additionally, there are letters and symbols like 'O', 'R', 'I', and 'RI' with arrows indicating relationships between the measures. A prominent curved line connects the 11th measure of the first system to the 11th measure of the fifth system. Another line connects the 12th measure of the second system to the 12th measure of the fourth system. The score is written in a fluid, handwritten style, suggesting it might be a composer's sketch or a personal manuscript.

Figure 5. Aldo Clementi, *Blues* (2001), page 2, nn. 11, 12, 12, 11, 10; and Aldo Clementi, *Blues 2* (2001), page 2, nn. 10, 11, 12, 12, 11

and therefore is not to be perceived as a linguistic chain, whose macro-structure is discourse made up of chordal phonematic groups (i.e. words) and the micro-structure governed “by the psychic opposition of acoustic impressions” (Saussure 1969, 45). The substance of the polyphony of Ockeghem and Isaac, of Webern and

of Clementi, is instead in the single melodic lines (“modulationi” Zarlino calls them), but even more in their intertwining, while the chords are by-products of the intertwining of the “modulationi”: the superimposition of sounds, harmony in the modern sense, has a timbric function, instead of a phonematic one, and the succession of the chords (almost always consonant in Ockeghem and Isaac, almost always dissonant in Webern and Clementi) must be resolved into continuous changes of colours. That is to say, harmony is dynamic weaving of “modulationi” and has a timbric function. For this reason the difference of predetermined analytical instrumental timbres serves no purpose: indeed, it can disturb the synthetic production of the timbre. For this reason Clementi, in the maturity of his late works, has a preference for homogeneous instrumental groups; this predilection is evident in his three works here considered: two for string quartet and one for piano.

Just as Mattietti (2001) theoretically codified the composition practice of Clementi, so Zarlino (1558) codified that of Renaissance polyphony, especially that of Willaert. I will first explain the meaning of some terms:

*Canto*: “modulatione, [horizontal] movement made from one sound to an other through different intervals”;

*Concento* (from *cum-cantus*: different *canti* together): interlacement of *modulationi*;

*Cantilena*: polyphonic composition.

And let us read now some passages from chapter 12 of the second part of *Le istituzioni harmoniche* by Zarlino:

Harmony is of two sorts, one of which we will call Proper and the other Not proper. Proper harmony is [...] *concento*, which is born of *modulationi*, which make the parts of every *cantilena* until the end is reached. Hence Harmony is a mixture of grave and acute sounds [...]; and it is born of the parts of a *cantilena*, through the progress that they make, producing chords together, until the end is reached; and it has puissance to dispose the soul to different passions. And [...] we can consider it in two ways, that is to say Perfect and Defective: Perfect Harmony, when many parts are found in one *cantilena*, which go singing together, so that between the extreme parts there are others; and Defective Harmony, when only two parts go singing together, without any other part being between them. Not proper Harmony [...] can better be called harmonious consonance than Harmony: for it contains in itself no *modulatione*, even if between the extremes there were other sounds; and it has no puissance to dispose the souls to different passions, like the Harmony called Proper, which is made up of many Not proper Harmonies (Zarlino 1558, 80).

Well, the music of Clementi is *concento*, *cantilena*, intertwining of *modulationi*: in short it is *perfect proper harmony*. But does it “have puissance to dispose the soul to different passions?” This is certainly not Clementi’s purpose. Indeed, his

music is rather “*disciplina quae de numeris loquitur*” (discipline that speaks of numbers), according to the definition by Cassiodorus, rather than “*scientia bene modulandi*” (art of singing well), according to the definition by Augustine; and it is, more precisely, paraphrasing the famous definition by Leibniz, “*exercitium arithmeticae manifestum coscientis se numerare animi*” (*evident arithmetical exercise of the mind aware of counting*).

The ancients divided the liberal arts into a group of four, *quadrivium*, and a group of three, *trivium*. The *quadrivium* included the exact sciences: *arithmetic*, *geometry*, *music* and *astrology*; the *trivium* included the logical arts, i.e. the discursive ones: *grammar*, *rhetoric* and *dialectics*. Quadrivial music is not an art but a science: the science of numerical proportions, on which there are founded not only the harmonic and rhythmic proportions of vocal and instrumental music, but also the macrocosmic proportions of astronomy and the microcosmic ones of creatures. Human musical practice is based on one side upon this quadrivial science, and on the other on the logical arts of the trivium, and especially on rhetoric. Hence the two constitutional principles of music, which I referred to at the beginning: *construction* and *discourse*.

It is the music dominated by *discourse* that “has puissance to dispose the soul to different passions”: that of Josquin, Monteverdi, Beethoven, Schönberg, Nono and Bussotti. That of Ockeghem, Bach, Webern and Clementi tends, instead, to exclusion, or at least to control, of the passions, that is to the *apathy* of the Stoics, but also to pleasant serenity, that is to say the *ataraxia* of the Epicureans. But the fire of life is not absent in the sonorous crystals of Clementi: that of his subjects, which are fragments of discursive music; one should notice the languid descending sixths and the impulsive ascending sixths that burn inside the clear ice of the three compositions that we have analyzed.

Aldo Clementi, invincible in the game of chess, defines his compositions as “self-governing sonorous organisms [...]: the composer brings his works into being automatically, determining their destiny with their shoots” (Clementi 1973, 50). His music, like that of Arvo Pärt or that of Henryk Mikolaj Górecki – given few elements, or even a single element, and given the rules – almost seems to germinate or to crystallize by itself. However, their music is not at all *minimalist*, but, on the contrary, *maximalist*: minimalist composers, slaves of compulsion to repeat, turn around on a single dimension; Clementi’s, Górecki’s and Pärt’s compositions are spheres or spirals that spread or contract.

On 25 May 2005 Aldo Clementi was eighty years old and the University of Catania, the city he was born in, celebrated him with a collection of writings. As we read in David Osmond-Smith’s contribution:

A life of obedience to the pleasure principle, made manifest through music, demands something more than resignation in the face of one’s appetites. It creates a familiar dilemma: if I love it, what can I do but repeat it? If I repeat it, what can I do but

get bored with it? The problem demands inventive action: one must make out of compulsive returns to the fascinating musical object something that is infinitely variable. This Clementi has done for many years. He has found a musician's response to the old question of what to do with the intractable nature of memory, the obstinate tenacity of the Proustian *petite phrase*. Beethoven and Brahms exorcised this compulsion to repeat through variations. Clementi constructs canons.

For the curators of twentieth century culture, canons came shrouded with a halo of lofty associations. It prompts austere memories of Webern, drawing extreme consequences from Schoenberg's example; of Dallapiccola enshrining beloved texts in crystal. Yet turning to Clementi, the hapless commentator instead finds himself enmeshed in the driest of Sicilian irony – one that obliterates the beloved musical object by canonically multiplying its reiterations. The most technically demanding of the games that music plays with mono-linear time is deployed, Medusa-like, to turn into an intricate mineral web what was once the sensuous trace of a human gesture.

A child of his time, Clementi initially devoted himself to wiping the slate clean of echoes from a fatally compromised past: his first canonic mobiles were serial. But old loves will have their revenge. The glass bubble that encased fifties modernism was bound, sooner or later, to crack. Many of Clementi's peers were obliged to resort to ingenious compromises with the historicist culture around them. Arrangement, commentary and allusion proliferated. Some, like Luciano Berio, proclaimed the distance between what they were still in love with, and what they might now attempt. Younger and less shrewd composers set out their stalls as knowing pasticheurs, oblivious of the narcissistic trape that prompted them to recreate within themselves the object of their passion.

Clementi's solution was as unique as it was implacable. If Schumann, Chopin or Brahms exerted their domination in spite of everything, then the problem, as always, was: what to do about it? Passions of the flesh offer a familiar escape into action; passions of aesthetic obsession are not so easily deflected. If liberating exertions there are to be, then they must be technical ones. To pile different versions of the *petite phrase* of the moment one on top of the other; to shift, calculate, adjust until the resultant aggregate makes its own musical sense, and then to demonstrate how, by slowing down its successive rotations, its sense may profoundly mutate: this has been Clementi's way of demonstrating that what appears to be a memorial to *le temps perdu*, a monument to irreparable loss, is in fact a recuperation of music's potential (Osmond-Smith 2005, 59-60).

I met Aldo Clementi more than fifty years ago: on Thursday 12<sup>th</sup> May 1960, during the general rehearsal of the inaugural concert of the first *Settimana Internazionale Nuova Musica* in Palermo. Sitting close to him, on the wooden stage at the Teatro Massimo, I read, in the score in his hands, his *Ideogrammi n. 1*, for sixteen instruments, as they were played for the first time, performed by members of the RAI orchestra of Rome, conducted by Daniele Paris. So I encountered the new music: alive, young, beautiful and fascinating.

Since then the music of Clementi has been among the stars that light up my life. I have shared other happy moments with him: in Rome, especially in the 1960s, together with Franco Evangelisti; in Catania, together with Francesco Pennisi, when their city on 26<sup>th</sup> December 1985 chose to celebrate them together, because at last, after Bellini, it once again had great composers; and then again in May 1987, when I presented him and his music, in public lectures, in the three Sicilian universities.

Clementi shares with Evangelisti the Varèse conception of music as “corporeification de l’intelligence qui est dans les sons” (“embodiment of the intelligence inherent in sounds themselves”), but with a radical difference: the attitude of Evangelisti is Dionysiac, that of Clementi Apollonian. The sound cosmos of Evangelisti is fresh and blazing (*silence* prevails in it), in *centrifugal expansion*: pure energy, with successive *explosions*, is concretized in sonorous matter, the tension grows in the movement that increases, new sonorous stars rise, and the world is dilated and *differentiated*. The sound cosmos of Clementi is old, in *centripetal contraction*, through a sequence of implosions: its universe becomes *more and more homogeneous*, the entropy increases, the motion slows to the point of being extinguished, the tension decreases, and the energy is totally exhausted, turned into sonorous matter that fills the whole space. The world contracts and is homogenized, every difference is levelled; time flows into eternity.

With Pennisi, instead, apart from having both been born under the Volcano, Clementi shares the Apollonian attitude, contemplation instead of flagrant action, the *catlike* perspective (“magnified details”), the instinct to eternity (“moving without moving”, “fusing space and time”, “impossible alchemy”). And, *pace* Adorno (Adorno 2001, 175), “the maturity of their late works... resembles that of fruits”: indeed they are “round, sweet, harmonious.” But the weaving of their music is different: with the soft filigrees and delicate colours of that elegant painter of watercolours there contrasts the strategic rigor and timbric decision of this great chess champion.

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